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HANDBOOK

FOR

TRAINING CENTER

ATHENS, GEORGIA

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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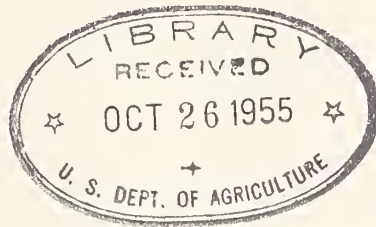


BOOK NUMBER

A56.7
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H A N D B O O K
F O R
S U B P R O F E S S I O N A L E M P L O Y E E S

S O I L C O N S E R V A T I O N S E R V I C E
T R A I N I N G C E N T E R
A t h e n s , G e o r g i a



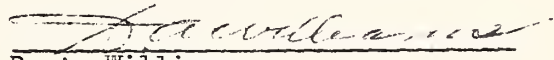
UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service

TO SUBPROFESSIONAL EMPLOYEES OF THE SOIL CONSERVATION SERVICE:

It is the desire of the Soil Conservation Service to provide the kind of training which will enable each new employee to develop into his job as rapidly as possible. The job of the subprofessional employee assigned to field operations requires that he master specific skill and techniques in the application of conservation practices according to accepted standards.

The Subprofessional Training Center is a part of the organized training program designed to furnish these training needs. The purpose of this Training Center is to provide instruction and experience which will enable the employee to more effectively master these required skills and techniques, enable him to assume his full responsibility in the application of sound conservation on the land and to help him prepare for advancement to work of greater responsibility.


D. A. Williams
Administrator

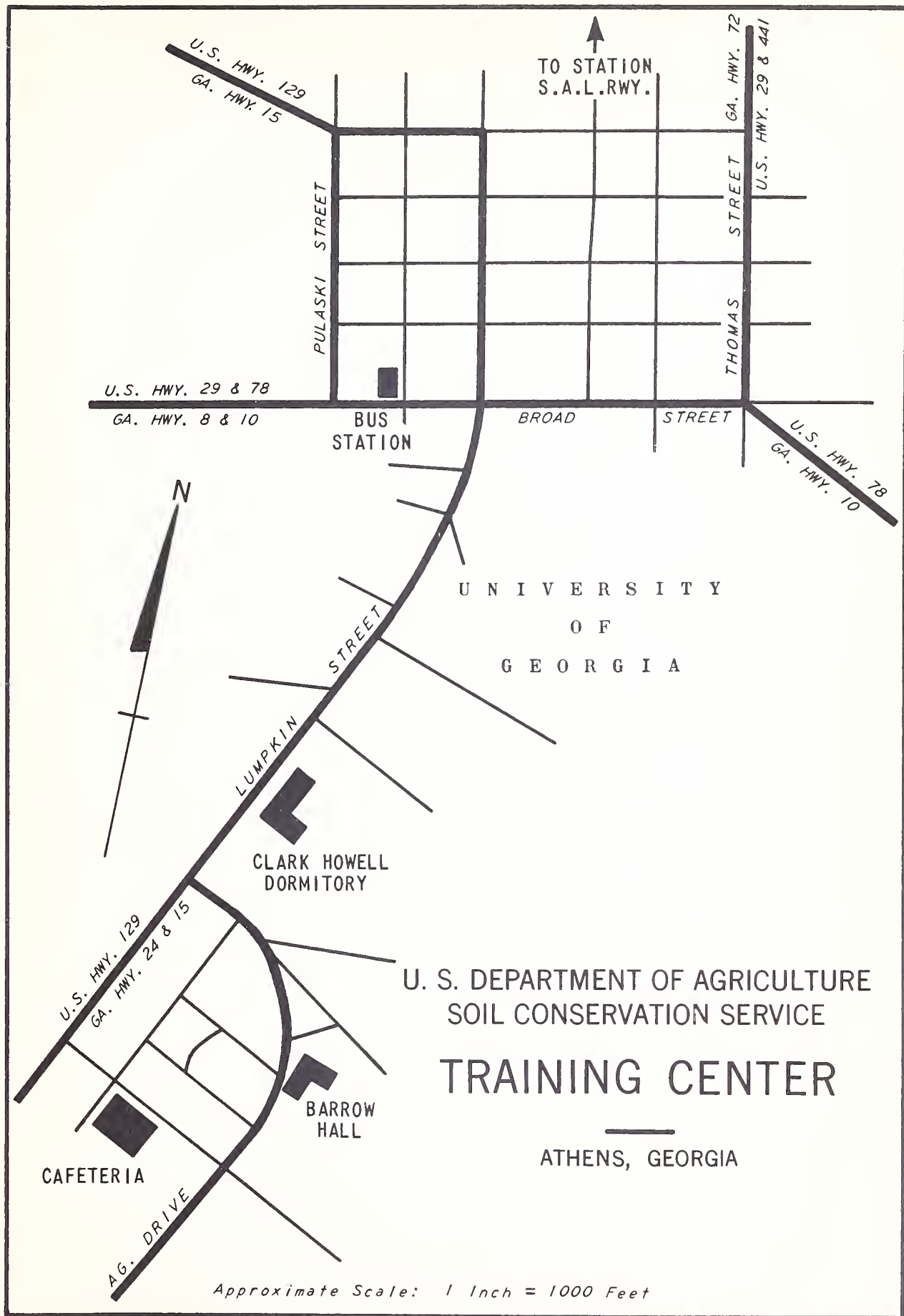


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Note: Information on Weir Notch & The Pythagorean Theorem
will be given.

INFORMATIONS AND INSTRUCTIONS

1. Location:

The Athens Training Center for professional and subprofessional employees of the Soil Conservation Service is located on the campus of the University of Georgia, Athens, Georgia. The Training Center Headquarters is Room 203 Barrow Hall, on "Ag" Hill.

2. Mailing Address: Post Office Box 1481, Athens, Georgia.

3. Telephone: Liberty 6-7034.

4. Transportation Facilities:

Via Rail - Seaboard Airline Railroad

Via Bus - Greyhound Bus Line

Via Air - Southern Airways, Atlanta-Charlotte Division

Taxi service is available in Athens at a reasonable rate.

If requested, travel by privately-owned auto may be authorized by the State Conservationist.

5. Time to Report:

Trainees should plan to arrive at Athens the afternoon or evening preceding the scheduled opening day.

6. Living Quarters and Meals:

Trainees will be quartered in Clark Howell Hall, a men's dormitory on Lumpkin Street near the football stadium.

Dormitory rooms include Nos. 255 to 267, inclusive, and are provided. A deduction of 80¢ per day will be made from the per diem rate of the trainee. Bedding, linen, towels and custodial service will be furnished.

Meals will be furnished each trainee at the University Cafeteria at a rate of approximately \$2.00 per day. Trainees will be expected to buy a meal ticket on the first day of the training period. A per diem rate of \$4.00 should be adequate to cover the cost of living expenses at the Training Center.

7. Course of Instructions:

The subprofessional course of instruction is for a period of three weeks. Various trainers will be in charge of the different technical phases of the field of soil and water conservation. Study of problems in the field complements study in the Training Center room. A detailed outline of subjects covered will be furnished each trainee.

8. Recommended Prerequisites:

- A. Trainees should complete their orientation prior to attending the Training Center. This can normally be accomplished in one or two months.
- B. Training and experience in coloring land capability maps and similar work unit jobs.
- C. An understanding of current memoranda regarding Records and Reports.
- D. An understanding of practices common to his work unit and how they fit into a complete soil and water conservation program.

9. Reports on Performance:

A final report is prepared at the close of the session and copies of this report are sent to the State Conservationist and Area Conservationist to become a part of the trainee's permanent personnel

record. Area Conservationist should discuss this report with the trainee, and schedule follow-up training.

10. Equipment Required:

Trainee should bring field clothes including footwear suitable for all weather conditions.

11. Time and Activity:

A. Time and Attendance report for trainees at the Training Center should be handled in the same manner as for an employee in travel status.

B. Daily Activities Record (SCS-192)

Trainee will complete and forward the SCS-192 as instructed by his Area Conservationist.

TRAINING CENTER STAFF

Resident Staff

Bennett, Jackson, Training Center Supervisor

Turkett, Warren B., Assistant Training Center Supervisor

Crouch, Mrs. Ellinor W., Clerk-Stenographer

Associate Staff

Bobo, William, Cartographer, Cartographic Unit, Spartanburg,
South Carolina.

Davison, Verne M., Biologist, Auburn, Alabama.

Dolvin, R. L., Area Conservationist, Elberton, Georgia.

Kneeee, R. R., Cartographer, Cartographic Unit, Spartanburg,
South Carolina.

Meares, George, State Administrative Officer, Columbia,
South Carolina.

Mitchell, H. C., Forester, Athens, Georgia.

SCHEDULE
SUBPROFESSIONAL TRAINING CENTER
ATHENS, GEORGIA

First Week

Monday

8:30 - 9:30	Office - Introduction	Bennett
9:30 - 10:30	Office - Training Center Facilities and Regulations for Operating	Turkett
10:30 - 12:30	Office - Orientation and Interviews	Meares
1:30 - 3:30	Office - Orientation and Interviews	Meares
3:30 - 5:30	Field - Pacing, Hand Leveling, etc.	Turkett
6:30 - 7:30	Office - Public Speaking	Bennett Turkett

Tuesday

8:30 - 9:30	Office - Care and Operation of Level	Turkett
9:30 - 10:30	Office - Notekeeping and Level Work	Turkett
10:30 - 12:30	Field - Practice Leveling Problems	Turkett
1:30 - 5:30	Field - Level Closures	Turkett

Wednesday

8:30 - 10:30	Office - Cross-section and Profile Procedures	Turkett
10:30 - 12:30	Office - Soil Surveys	Bennett
1:30 - 5:30	Field - Cross-section and Profile Problems	Turkett
6:30 - 7:30	Office - Public Speaking	Bennett Turkett

Thursday

8:30 - 10:30	Office - Plotting Cross-section Profile	Turkett
10:30 - 12:30	Office - Land Capability	Bennett
1:30 - 5:30	Field - Land Capability	Bennett

Friday

8:30 - 12:30	Office and Field - Biology	Davision
1:30 - 3:30	Office - Surveys	Turkett
3:30 - 5:30	Office - Review of Engineering Practices	Turkett

Second Week

Monday

8:30 - 12:30	Office - Cartography - Photo Interpretation	Dobo
1:30 - 5:30	Office - Cartography - Lettering, etc.	Kneeco

Tuesday

8:30 - 12:30	Office - Cartography - Using Maps, and Photo Interpretation	Kneece Bobo
1:30 - 3:30	Office - Human Relations	State Conservationist
3:30 - 5:30	Office - Land Use and Water Disposal	Turkett
6:30 - 7:30	Office - Public Speaking	Bennett Turkett

Wednesday

8:30 - 12:30	Field - Land Use and Water Disposal	Turkett
1:30 - 5:30	Field - Land Use and Water Disposal	Turkett

Thursday

8:30 - 12:30	Field - Land Use and Water Disposal	Turkett
1:30 - 5:30	Field - Woodland Management	Mitchell
6:30 - 7:30	Office - Public Speaking	Bennett Turkett

Friday

8:30 - 12:30	Field - Woodland Management	Mitchell
1:30 - 5:30	Field - Woodland Management	Mitchell

Third Week

Monday

8:30 - 12:30	Field - Land Use and Water Disposal	Turkett
1:30 - 5:30	Field - Land Use and Water Disposal	Turkett
6:30 - 7:30	Office - Public Speaking	Bennett
		Turkett

Tuesday

8:30 - 10:30	Office - Summarize Land Use and Water Disposal Problems	Turkett
10:30 - 12:30	Office - Reports and Records	Dolvin
1:30 - 5:30	Field - Research - Field Experiments	Bennett

Wednesday

8:30 - 12:30	Field - Drainage	Turkett
1:30 - 3:30	Office and Field - Irrigation	Turkett
3:30 - 5:30	Office - Farm Ponds	Turkett
6:30 - 7:30	Office - Public Speaking	Bennett
		Turkett

Thursday

8:30 - 12:30	Field - Farm Ponds	Turkett
1:30 - 5:30	Field - Farm Ponds	Turkett

Friday

8:30 - 10:30	Office - Summarize Pond Work	Turkett
10:30 - 12:30	Office - Examination and Individual Conferences	Bennett
		Turkett
1:30 - 2:30	Office - Examination and Individual Conferences	Bennett
		Turkett
2:30 - 4:30	Office - Review Course and Check Out	Bennett
		Turkett

PUBLIC SPEAKING PERIODS

These periods are designed to build the trainees' confidence in their ability to speak before groups, conduct meetings, and introduce speakers.

The discussion periods are organized and conducted by the trainees following an assignment chart which will be posted early in the session.

Officers and their duties are as follows:

1. Chairman - will preside over the meeting and is responsible for the timely and proper conduct of the meeting following Robert's Rules of Order.
2. Topic Chairman - will select the topic for the one-minute speeches and take charge of the meeting while they are being presented.
3. Toastmaster - will take charge of the meeting while the five-minute speeches are being presented and will properly introduce each speaker.
4. Chief Evaluator and one (1) Assistant - the Chief Evaluator will take charge of the meeting during the evaluation period. Both evaluators will listen analytically and critically to all speeches. Tell what was good about each speech and speaker and what was distracting, on general principles. Don't try to "tear the speaker apart", and do not be too complimentary. If you give criticism, try to offer a suggested improvement.
5. Grammarian - checks mispronunciation of words, calls attention to careless enunciation, slurring of syllables

and of endings. He watches for words and phrases incorrectly used, and for errors in grammar. He does not hurt for mistakes, but takes them when they are noticeable.

He pays a compliment when it is deserved.

6. Timekeeper - keeps time of all speakers giving a predetermined signal of various time intervals during the speech.

Reports time used by each speaker.

7. Parliamentarian - should be prepared to assist the Chairman with questions regarding parliamentary procedure.

Each trainee will have an opportunity to serve in above capacity or give either a one-minute or five-minute speech during each period.

INTRODUCTIONS

1. Trainees will present themselves to the group by full name, name commonly used, location, length of time in the Soil Conservation Service, name of Work Unit Conservationist and Name of Area Conservationist. Other information will be of interest, such as hobbies, recreation, military experience, size of family, etc., and will help trainees get acquainted.
2. Brief discussion regarding instructors who will participate in course, how the course will be conducted and the objectives of the training session.

TRAINING CENTER FACILITIES

1. Facilities and regulations.
2. Assignment of duties.
3. Records of accomplishment.

SAFETY ORGANIZATION

1. Explain safety organization.
 - A. Discuss safety:
 1. While working.
 2. While driving vehicles.
 3. Off hours, recreation
 - B. Explain Safety Inspection and Report for Training Session.
 - C. Fire prevention in a safety program.

ORIENTATION

- I. Introduction to the orientation session.
- II. History of Soil Conservation.
 - A. There have been four eras:
 - 1. Recognition
 - 2. Experimental
 - 3. Demonstrative
 - 4. Application
- III. The Soil Conservation Service.
 - A. Originated by an Act of Congress.
 - 1. Purpose
 - 2. Objective
 - B. Subsequent acts which extended Service responsibility.
 - C. Watershed movement - past - present.
 - D. Relationships with other agencies - Extension - A.S.C.
 - E. Research
- IV. The Soil Conservation District movement.
 - A. History of district movement.
 - B. Concepts and principles.
 - C. District formation.
 - D. State and national organization.
 - E. Cooperating Federal and State agencies.
- V. Relationship of districts and SCS.
 - A. Request for assistance of the Soil Conservation Service.
 - B. District program and work plan.
 - C. Memorandum of understanding and supplemental memorandum.

- D. District governing body and Soil Conservation Service personnel.

VI. Organization of the Soil Conservation Service.

- A. Line organization.
- B. Staff function.
- C. Basic policies.
- D. Relationship between Area Conservationist and Work Unit Conservationist.
- E. Organization at the Work Unit Level.

VII. Careers in Soil Conservation Service.

- A. Personnel program.
 - 1. Career system in SCS.
 - 2. Job review.
 - 3. Performance standards and inspections.
 - 4. Performance ratings.
- B. Rights, privileges, and obligations.
 - 1. Probational appointment.
 - 2. Position classification and pay.
 - 3. Leave
 - 4. Retirement and Social Security.
 - 5. Transfers - movement of household goods - transportation.
 - 6. Outside work.
 - 7. Political activity.
 - 8. Employee organizations.
- C. Awards Program.
- D. Safety Health.

D. Safety and Health (cont'd)

1. Accidents - liability.
2. Compensation - doctors.
3. First Aid.

ENGINEERING

I. Measurement of horizontal distance.

A. Pacing (correct definition).

B. Striding (correct definition).

1. Method of determining length of each.
2. Extent of use in our work.

C. Chaining

1. Equipment used.

- a. Chains (describe each and care).
- b. Tapes (describe each and care).
- c. Chaining Pins (describe use and care).
- d. Range Poles (describe use and care).
- e. Plumb Bob (describe use and care).
- f. Note keeping for chaining.

2. Measurement by chaining.

- a. Method of setting pins.
- b. Use of Hubs, Stakes and Tacks.

3. Common errors in chaining.

- a. Imperfect alignment.
- b. Chain not horizontal.
- c. Counting pins.
- d. Tension

D. Stadia (explain).

Field

1. Chaining demonstration - set up pacing course.
2. Pace or stride 500 feet four (4) times.

10/17

10/17

• 10/17

10/17

10/17

- a. Record notes.
- b. Determine pace and stride factor.
- 3. Pace unknown distance.
- 4. Chain unknown distance and check return.

Equipment used:

- 1. Two (2) 100 ft. Tapes.
- 2. Two (2) Range Poles.
- 3. Four (4) Plumb Bobs.
- 4. Two (2) sets Chaining Pins.
- 5. Four (4) Stakes.
- 6. One (1) notebook for each person.
- 7. One (1) pencil for each person.

II. Measurement of vertical distances.

- A. Barometer
- B. Trigonometric
- C. Leveling

1. Equipment used in leveling

a. Instruments for vertical measurements

- (1) Abney (describe)
- (2) Locke (describe)
- (3) Wye (describe)
- (4) Dumpy (describe)
- (5) Transit
- (6) Theodolite

b. Rods

- (1) Philadelphia (describe)
- (2) Frisco or California (describe)
- (3) Chicago or Detroit (describe)
- (4) Stadia (describe)
- (5) Terracing (describe)

c. Tripod

d. Target

e. Hatchet

2. Measurements by leveling.

- a. Use of levels (also care).
- b. Use of Rods (also care).
- c. Use of Targets.
- d. Use of Hatchet.
- e. Note keeping for leveling.

c. Note keeping for leveling (cont'd).

(1) Principles of leveling.

(a) Datum

(a-1) Sea level

(a-2) Assumed

(2) Terms used in leveling.

(a) Foresight (F.S.)

(b) Backsight (B.S.)

(c) Bench Mark (B.M.)

(d) Height of instrument (H.I.)

(e) Elevation (elev.)

(f) Turning Point (T.P.)

(g) Temporary Bench Mark (T.B.M.)

(3) Keeping and checking notes.

(a) Identification of book.

(b) Index of book.

(c) Information at top of page.

(c-1) Title

(c-2) Location

(c-3) Address

(c-4) Owner

(c-5) Date

(c-6) Weather

(c-7) Party

(c-8) Plan # and Field #

(c-9) Photo #

- (d) Identification of columns.
- (e) Recording data.
 - (e-1) Numerical (corrections)
 - (e-2) Lettering
 - (e-3) Pencils
- (f) Complete Bench Mark description.
- (g) Sketch
- (h) Checking notes for errors.
 - (h-1) Closed circuit (explain)
 - (h-2) Open circuit (explain)

3. Errors in leveling.

- (a) Misreading rod.
- (b) Level not in adjustment.
- (c) Backsights and foresights not equal.
- (d) Not recording as read.
- (e) Rod not vertical.
- (f) Not centering bubble.
- (g) Unnecessary clamping of spindle.
- (h) Resting the hand on telescope or tripod.
- (i) Allowing grit or mud to accumulate on end of rod.
- (j) Disturbance of level.
- (k) Turning point not firm.
- (l) Natural sources (sun or wind).
- (m) Interchanging backsights and foresights.
- (n) Neglecting to enter a reading.
- (o) Parallax

Equipment Needed:

1. One (1) level for each two (2) persons.
2. One (1) tripod for each two (2) persons.
3. One (1) Rod for each t wo (2) persons.
4. One (1) hatchet for each two (2) persons.
5. One (1) notebook for each person.
6. One (1) pencil per person.

Types of level lines.

Differential levels (define) (describe use).

Profile levels w/cross section (define) (describe use).

III. Differential Leveling (field problem).

- A. Run a closed circuit, operating instrument,
keeping notes and closing within an allowable error.

IV. Profile and cross section leveling.

- A. Profile - survey procedure.
- B. Cross Section - survey procedure.

- 1. From a base line.
- 2. From the centerline of a stream or gully.

C. Field problem

Survey the profile of stream and take cross sections at
given distances along profile.

D. Plotting profiles and cross sections from field notebooks.

- 1. Paper
 - a. Profile
 - b. Cross section
- 2. Scales
 - a. Profile
 - b. Cross section

SOILS, SOIL SURVEYS AND LAND CAPABILITY

<u>Hours</u>	<u>Place</u>
--------------	--------------

2	Office
---	--------

- I. What is a soil?
- II. Function in plant life, providing:
 - A. Support
 - B. Food
 - C. Water and air
- III. How are soils formed?
 - A. Geology and Geomorphology.
 - B. Weathering process.
- IV. How do soils differ?
 - A. Depth
 - B. Horizons - arrangement and thickness.
 - C. Texture and Structure.
 - D. Permeability - water, air relationship.
 - E. Clay colloid.
 - F. Color, stoniness, alkaili, etc.
- V. Why do soils differ?
 - A. Parent material.
 - B. Climate
 - C. Age
 - D. Topography - slope and natural drainage.
 - E. Vegetation, animals and man.

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in

Hours Place

VI. Soil Classification in the U.S.D.A. today.

A. Soil Units

1. Soil types
2. Soil complexes
3. Soil mapping units (correlated and uncorrelated).

B. Slope

C. Erosion, kinds and degree.

VII. Demonstration of a number of soil textural grades.

2 Office VIII. Land capability concept - the basic policy of the U.S.D.A.

A. Describe land capability classes in relation to:

1. Major suitability.
2. Subclasses based on major hazard to continued use: e, w, s and c.
3. Land capability units.

B. Land Capability Table.

1. How developed.
2. Guide sheets and other aids.

4 Field

C. Field trip to show land capability classes on a local farm. Farm selected to show as many land classes and subclasses as feasible.

Tools and other aids needed:

1. Aerial photograph for land capability tour.
2. Soil Augers, Abney Levels, Spades, Clipboards.
3. Soil samples of predetermined texture.
4. Kodachrome slides of soil profiles, land capability classes, etc.
5. Soil profile monoliths and micromonoliths.
6. Charts as needed.
7. References: Soil Survey Manual, Soils and Men,
Guide for Soil Conservation Surveys,
The Measure of Our Land, and Soil
Survey Bulletins, as needed.

BIOLOGY COURSE - SCS TRAINING SCHOOL - ATHENS, GA.

- I. Agricultural concept in SCS Biology. Lecture, using "More Fish & Game". (Copies are available at Center, distributed at close of lecture.)
- II. Read titles and indicate scope of South Carolina Biology Guides. Record number of trainees interested in each - - (show of hands). Recess - - Arrange slides and machine.
- III. Show 22 slides illustrating land use possibilities (slides at Center).
- IV. Discuss establishment and maintenance of field borders, lespedeza food strips and multiflora rose fences. Recess.
- V. Wetland Management - - drainage, ducks (marshes and ponds).
- VI. Fishpond management and design for fish (with slides). Recess.
- VII. Miscellaneous biology problems - - requested by trainees.
- VIII. Each trainee to list, from memory or notes, his biology work as:
 1. Commonly needed
 2. Occasionally needed, or
 3. Rarely if ever needed.
- IX. Summary "Biology in the SCS" - - objectives, general values in coordinated program, expression of appreciation to Class. Response by class spokesman.

V. Surveys

A. U. S. System of public land surveys.

1. History
2. Longitude (meridians)
3. Latitudes (baseline and correction lines)
4. Sub-divisions
 - a. Range lines and township lines
 - b. Sections
 - c. $1/4$ sections
5. Legal description

B. Metes and Bounds Surveys.

1. History
2. Bearings
3. Distances
4. Scales
5. Plot boundry lines from plat to aerial photos.

GENERAL CARTOGRAPHIC

1. Lettering

- A. The necessity for doing legible lettering. Common errors and the resulting misinterpretation.
- B. The simple block lettering style and the differences between the capital and lower case letters. The vertical as compared to the slanted lettering style block letters.
- C. How to do legible lettering, the basic strokes and sequence.
(practice)

2. Maps - General

Brief discussion of various types of maps of use to field technicians which are available for general or specific problems.

3. Maps - Soil and Capability Maps

- A. Brief discussion requirements for securing the kind of final maps desired for use in the farm plan.
- B. Procedure for requesting these maps from Cartographic Unit including the difference between states.
- C. Methods for coloring Soil and Capability Maps according to capabilities. Instruction in use of water color pencils for coloring. (practice)

4. Maps - Land Use Maps

- A. Methods for making the sketches of the plan legible and clear, including the use of conventional map symbols, colors, and legible lettering.
- B. Brief discussion of the several types of land use maps in use in the several states and procedures for obtaining them.

5. Maps - For Special Planning Purposes

6. Photo-Mosaics

General discussion of use and limitations, including accuracy, scale and size. When to use and how to secure.

7. Special Maps for use in connection with information and education activities.

8. Outline of Cartographic functions in addition to those discussed above. General requirements for making requests including approvals when required, scale, size, allowance of adequate time for delivery. How to be sure that deadlines are met.

AERIAL SURVEYS AND PHOTO-INTERPRETATION

1. The scope and application of stereoscopic methods of photo-interpretation techniques.
2. Explanation and comparison of stereoscopic vision as applied to photo-interpretation and normal habits of viewing objects and scenes. The third dimension in stereo-viewing.
3. The various types of stereoscopes and their application in viewing aerial photographs in the third dimension.
4. The adjustment of stereoscopes which will be most commonly used.
5. Adapting the eyes and eye muscles to the requirements for the viewing and study of stereoscopic pairs of photos.
6. Positioning and manipulation of aerial photographs for stereo study.
7. The delineation of drainage and the location of pond sites by use of photo-interpretation techniques with aerial photographs.
8. Running out watershed boundaries.
9. Recognizing different degrees of slope, developing keys which indicate various physical conditions of the land.
10. The properties and characteristics of aerial photographs. How those properties are used in stereoscopic plotting instruments for the measurement or mapping of various features of the earth's surface.
11. Match-lining the effective areas of aerial photographs.

12. Typing and matching soil survey delineations from one photograph to the adjoining one. Transferring soil survey data from one photo to another.
13. The Service policy on the distribution of aerial photographs.
Extent to which aerial photographs are available.

AGRONOMY

<u>Hours</u>	<u>Place</u>
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1	Office
---	--------

I. Pastures in the Southeast.

A. How to get started.

1. Seeding mixture - grass and legume
2. Natural soil fertility. Response to:
 - a. Lime
 - b. Nitrogen
 - c. Phosphate
 - d. Potash
3. Seeding mixtures adapted to the cooler sections.
4. Seeding mixtures adapted to the middle belt.
5. Seeding mixtures adapted to the Lower Coastal Plain and Florida.
6. How to prepare seedbed.
7. When to sow.

B. Management of pastures.

1. Crowding out of species a major problem.
2. Some advantages of overgrazing and undergrazing.
3. Some disadvantages of overgrazing and undergrazing.

C. Supplemental pastures.

1. Grass crops
2. Legume crops

D. Major problems in a permanent pasture program.

1. Maintenance of proper balance of grass and legume.
2. Palatability, drought and disease resistance problems.

E. Acreage reseeded for animal units.

<u>Hours</u>	<u>Place</u>	
1	Office	II. Cropland rotations for conservation and improvement. <ul style="list-style-type: none">A. Government acreage restrictions on certain crops.B. Intensity of rotation based on land capability classification.<ul style="list-style-type: none">1. Land Class I.2. Land Class IIe, IIw and IIIs.3. Land Class IIIe, IIIw and IIIs.4. Land Class IVe, IVw and IVs.5. Land in classes V, VI, VII and VIII not suitable for cropland rotation.C. Soil depleting crops common to the Southeast.D. Legumes and grasses useful for soil improvement.E. Small grains and sorghums used in rotations.F. Pattern of the rotation.<ul style="list-style-type: none">1. Field2. Contour strip cropping3. Perennial stripsG. Plants adapted for use on field borders and in water disposal areas.
1/2	Field	III. Field trip to study plots of growing species and mounted specimens.

VI. Land Use and Water Disposal.

A. Land Uses

1. Rotated Cropland

a. Terraceable slopes

(1) Land Classes IIc and IIIc.

(2) Conditions for terracing Class IVc.

b. Non-terraceable slopes

(1) Knobby land

(2) Critical slopes

2. Permanent Pasture Land

3. Woodland

4. Wildlife

B. Outlets

1. Purpose and Use.

2. Location

a. Natural depressions

(1) Well defined - - over 12 in. in depth.

(2) Medium defined - - 6-11 in. in depth.

(3) Slightly defined - - less than 6 in.
in depth.

b. Other areas

(1) Knolls

(2) Barriers - - roads, property lines, etc.

3. Types

a. Meadow

b. "V"

c. "W"

d. Half "W"

4. Construction

5. Treatment

6. Maintenance

C. Terraces

1. Location

2. Layout

a. Direction

b. Grade

3. Construction

a. Size

b. Shape

c. Methods

4. Row arrangement

5. Maintenance

a. Land preparation

b. Plowing to maintain

D. Fences

1. Location

a. On ridge.

b. On contour between land uses.

c. On contour terraced field.

d. Along outlets.

E. Farm Roads

1. Location

a. On ridges.

b. On contour.

c. On ridge "W" ditch.

F. Diversion Ditches.

1. Purpose
2. Where they apply.
3. Location
4. Design - see table.
5. Layout
 - a. Direction
 - b. Grade
6. Construction
 - a. Size
 - b. Shape
 - c. Methods

Materials Needed:

1. Blackboard with chalk and eraser.
2. Engineering Handbook for each person.
3. One (1) Clipboard for each person.
4. One (1) Engineers' Field Notebook for each person,
or three (3) sheets per person of Engineers' Loose-leaf
Notebook.

WATER DISPOSAL (FIELD)

- I. Stake out the outlets as planned.
- II. Locate key terraces as planned.
- III. Stake all terraces in the watershed and keep necessary guide notes.
- IV. As a group, all students will review the plans in each watershed.
- V. Summary

Materials Needed:

1. One (1) conservation survey map per person.
2. One (1) relief map of water disposal system per person.
3. One (1) level and rod for each four (4) persons.
4. One 100' steel tape.
5. One (1) hatchet for each four (4) persons.
6. 100 stakes - minimum 30" long for each four (4) persons.

WOODLAND CONSERVATION

Office (4 hours)

I. Orientation

A. Status of Woodland in Southeastern States.

1. Land use
2. Ownership
3. Condition
4. Place in Regional Economics.

B. Policy and Relations.

1. Other agency responsibilities.
2. SCS responsibility in work units.

II. Woodland Practices in farm plans (what and why).

A. Protection

1. Fire control

- a. Agency responsibility.
- b. Fire damage and benefit.
- c. Kinds and uses of firebreaks.

2. Livestock control

- a. Identifying grazing damage and benefits.
- b. Control methods.

3. Insect and disease control.

- a. Agency responsibilities.
- b. General control methods and procedures.

B. Getting a stand of trees.

1. Natural reproduction.
2. Release cutting.

3. Interplanting
4. Underplanting
5. Field planting
6. Windbreak planting

C. Cutting practices

1. Thinning
2. Release
3. Salvage
4. Crop trees
5. Cutting cycle and cutting compartments.

III. Application of woodland practices (how and

A. Protection

1. Firebreaks - methods of construction.
2. Fencing - types and uses.

B. Getting a stand.

1. Care of seedlings.
2. Methods of planting.
3. Spacing
4. Site preparation.

C. Cutting rules.

1. Worst first.
2. Thinning (how to mark, how to teach).
3. Release (methods, cost).
4. Salvage
5. Crop trees (how to select and count).

Field (8 hours)

IV. Application of practices.

A. Planting (methods demonstration).

B. Cutting

1. Mark for thinning.

2. Select culls and salvage trees.

3. Compute, select and count crop trees.

RECORDS AND REPORTS

A. Records and Reports

1. Need for complete records and accurate reports.

- a. Locally
- b. State
- c. Washington

B. Records

1. Purpose and policy.

2. Current Records.

Plan of operations.

- a. Daily Activities Record, SCS-192 or 192a.
- b. Time Distribution Spread Sheet, SCS-501.
- c. Summary of Monthly Time Record SCS-501a.
- d. Record of Conservation Planning and Application, SCS-196, SCS-196a.
- e. Accomplishments on the Land, 197 and 197a or 197b.
- f. Summary of Surveys, SCS-206.
- g. Register of ACP Referrals, SCS-201.
- h. Cooperator Register.
- i. Time Card, AD-1130.
- j. Auto Record Book, AD-187.

C. Reports

1. Purpose and Policy.

2. Current reports.

- a. Progress Reports, SCS-195, 195a or 195b.

Reports (cont'd)

- b. Progress Reports on MCP - SCS-200.
- c. Conservation Needs and Goals, SCS-199.
- d. Auto Summary Report, AD-187a.

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RESEARCH

<u>Hours</u>	<u>Place</u>	
4	Field	<ul style="list-style-type: none">I. Study of run-off plots at the Southern Piedmont Experiment Station.<ul style="list-style-type: none">A. Land Class IIc.B. Land Class IIIc.C. Land Class IVc.D. 20 acre watershed.E. Grass-based rotation plots.II. Study of 100 acre farm unit at the Experiment Station.<ul style="list-style-type: none">A. Land use practices.<ul style="list-style-type: none">1. For erosion control.2. IncomeB. Coastal Bermuda experimental plots.III. Study of Pine planting.<ul style="list-style-type: none">A. Adapted species.B. Acreas needing preplanting treatment.IV. Summary of experimental data on erosion control.<ul style="list-style-type: none">A. Kind of soil material loss by erosion.B. Season of greatest soil loss.C. Allowable soil loss in Southeast.

DRAINAGE

A. Purpose and Scope:

To teach the Aid to design simple drainage systems for small areas of agricultural land.

B. Effects and Benefits of land drainage.

1. Define drainage.
2. Kinds of water in the soil.
 - a. Hygroscopic moisture.
 - b. Capillary water.
 - c. Free water.
3. Benefits of land drainage.
 - a. Bacterial action.
 - b. Soil aeration.
 - c. Temperature of soil.
 - d. Root zone.

C. General conditions under which drainage is feasible.

1. Capability of land.
2. Availability of outlet.
3. Degree of drainage required.
4. Protection from overflow.
5. Anticipated returns (increase).

D. Preliminary investigation of drainage jobs.

1. Reconnaissance of area.
 - a. Importance and general nature.
 - b. Nature of the soil.
 - c. Determine if job is feasible.
 - d. Soil borings.

- E. Assembling maps and other pre-field data.
- F. Preliminary instrument survey.
 - 1. Outlets
 - 2. Lay of the land (level shot).
 - 3. Bench Mark
 - 4. Topographic information.
 - 5. Needed profile.
- G. Other preliminary information.
 - 1. Soils information.
 - 2. Area to be drained delineated on aerial photo.
 - 3. Drainage area affecting design.
 - 4. Size and elevation of culverts, bridges and other fixed features.
 - 5. Crops to be grown.
- H. Preliminary design to determine:
 - 1. Cost estimate.
 - 2. Appraisal of benefits.
- I. Discuss proposed problem and solution with planners.
- J. Final Survey
 - 1. Profile where there is an existing ditch.
 - a. At even 100 ' sta - and critical points between sta.
 - b. On existing culverts, tiles, etc.
 - (1) Location
 - (2) Size of openings.
 - (3) Length

c. Trapezoidal ditches

(1) Location surveys

(2) Profile surveys

(3) Factors affecting design.

(a) Side slopes

(a-1) Method of excavation.

Hand may be nearly vertical.

Special shaped dragline buckets, 1/2 to 1.

Explosives (1 to 1).

Blade Grader or Bulldozer (2 to 1 or flatter).

Regular dragline, any side slope.

(a-2) Side slopes and soils.

Nearly vertical to 1 to 1.
(organic - tight and stable mineral soils).

1-1/2 to 1 (most Southeastern soils).

2 to 1 or flatter (require careful planning).

(b) Depth (4' deep where practical).

(c) Berm width.

(c-1) Soil not spread (15' min.).

(c-2) Soil spread (enough for equipment to work).

(d) Drainage area and land use.

d. Open ditch structures.

(4) Kind of material.

(5) Elevations

c. Where open ditches, laterals, etc.,
drain into ditch.

2. Profile of new ditch.

a. Elevations along center line at 100' sta. and at
critical points.

b. On existing culverts, bridges, roads, ditches and
tiles.

(1) Location

(4) Kind of material

(2) Size

(5) Elevation

(3) Length

3. Side shots

a. Location with reference to profile.

b. Elevation

K. Design Criteria

1. Surface drainage

a. "V" Type ditches

(1) Surveys and location .

(2) Spacing and grade.

(3) Depth and side slopes.

b. "W" Type ditches.

(1) Surveys and layout.

(2) Cross-section

2. Sub-surface drainage.

a. Open trapezoidal drains.

b. Tile drains.

(1) Soils

(2) Surveys

(a) Topographic

(b) Profile

(3) Depth and spacing.

(4) Gradients (table).

(5) Joints and junctions.

(6) Tile outlets.

(a) Elevation

(b) Number

(c) Outlet Joint

(7) Tree roots

3. Seepage intercepting drains.

a. Contour tile line.

b. Stub tile line.

L. Design

1. "V" ditches (table MR 52-36)

(MR-52-35)

2. Trapezoidal ditches (table MR-52-38).

(MR-52-31)

3. Tile (tablos (2-L-3331)).

Field

Run profile for tile design.

Run profile for open ditch design.

Equipment needed:

1. One (1) Topographic map of area for each person.
2. One (1) Level for each two (2) persons.
3. One (1) Tripod for each two (2) persons.
4. One (1) Rod and One (1) hatchet for each two (2) persons.
5. Ten (10) Stakes.
6. One (1) Notebook per person.
7. One (1) Pencil per person.
8. One (1) Clipboard per person.

IRRIGATION

I. Purpose

- A. Assist District Cooperators with irrigation problems.
- B. Collect field data for Design Engineer.
- C. Working knowledge of designed system and application of principles in Soil, Water and Plant relationships.

II. Use of Irrigation Guido.

III. Field Data.

- A. Water Supply
- B. Fields to be irrigated.
- C. Crops to be irrigated.
- D. Elevations
- E. Labor and Labor Schedule.
- F. Sources of Power.

IV. Application of Designed System.

- A. Explain plan and layout to planner.
- B. Operations schedule.
- C. Management of crops.

FARM PONDS

Office

- I. Farm Pond Purpose and Policies.
 - A. Livestock
 - B. Irrigation
 - C. Fish production
 - D. Other farm uses
- II. Site Selection.
 - A. Acres (drainage area) draining into pond.
 - B. Land use in drainage area.
 - C. Silt contributing areas in watershed.
 - D. Desirable topography at dam site.
 - E. Soil material under proposed lake.
 - F. Soil material under proposed dam.
 - G. Cut-off Seal, Core, Purpose.
 - H. Desirable topography conditions for spillway.
 - I. Borrow pit selection - embankment material.
- III. Parts of the Impounding Structure.
 - A. Dam or embankment.
 - B. Spillway - sod.
 - C. Trickle drain.
- IV. Planning the Dam.
 - A. Side slopes.
 - B. Freeboard - correct definition.
 - C. High water elevation.
 - D. Spillway crest elevation.

1. 2. 3. 4. 5.

6. 7. 8. 9. 10. 11. 12. 13. 14. 15.

16. 17. 18. 19. 20. 21. 22. 23. 24. 25.

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98.

99. 100. 101. 102. 103. 104. 105. 106. 107. 108.

109. 110. 111. 112. 113. 114. 115. 116. 117. 118.

V. Construction of Dam.

- A. Clearing of the side and disposal of debris.
- B. Cut-off seal excavation - side slopes of trench.
- C. Backfilling cut-off seal trench - placing fill material and compaction.
- D. Thickness of layers of fill material and compaction.
- E. Moisture of fill material when placed.

VI. Planning the Sod Spillway.

- A. Run-off expected for designed storm.
- B. Spillway width and depth - table - how used.
- C. Depth of flow in spillway for the designed storm.

VII. Sod Spillway Construction.

- A. Side slopes of spillway channel.
- B. Grade in spillway - table explanation.
- C. Sod to use in spillway - table - explanation.

VIII. Planning the Trickle Drain.

- A. Purpose of the drain.
- B. Materials for trickle drain - pipe.
- C. Size of pipe for trickle drain.
- D. Elevation of top of standpipe below crest of spillway.

IX. Construction of the Trickle Drain.

- A. Pipe must be placed under or around the fill on undisturbed soil - soil well packed - anti-soep collars.
- B. Stand pipe placed on concrete slab and braced.

X. Seeding or sodding Embankment and Spillway.

XI. Explain use of plan Form Nos. M-51-87-1 and MR-51-87-1(R).

XII. As summary, present a step by step procedure for:

- A. Making the on-site investigation and recording the data.
- B. Planning the structure.
- C. Staking the structure.

Materials Needed:

- 1. Handbook for each person.
- 2. Blackboard, crayon and eraser.
- 3. Four (4) MR Forms for each person.
- 4. Provisions for using slides.

Field

- I. Field investigation - soil borings, under the proposed dam, under the proposed pond and borrow pits - record findings.
- II. Run profile of center-line of dam and spillway - take necessary cross-section of spillway. Run water line.
- III. Plot these profiles.
- IV. Plan the dams - record notes - consider AC-FT of water stored.
- V. Plan spillway - record notes.
- VI. Plan trickle drain.
- VII. From field notes fill out Form MR 51-87.
- VIII. Make bill of material for trickle drain.
- IX. Calculate yardage in dam.
- X. Estimate the cost of the structure.
- XI. Stake out dam and spillway.
- XII. Summary

Materials Needed:

1. Handbook for each person.
2. One (1) level and rod for each five (5) persons.
3. One (1) hatchet for each five (5) persons.
4. One (1) 100' steel tape for each five (5) persons.
5. 100 wood stakes for each party.

Weir Notch

1. Use in our work.

a. Check small stream and spring flow.

2. Types

a. Rectangular (This method is used for measuring
fairly large streams)

b. 90 degree V notch.

Explain use of tables.

Layout of 90° - angles with Tape.

Pythagorean Theorem (define).

1. Use in our work.
 - a. Layout of grid for topographic survey.
 - b. Mapping meanders of streams.
 - c. Layout of irrigation systems, tile, etc.
 - d. Layout of any 90° angle.

Chord method for laying out 90° angles.

Layout

1. Through some point within 100' of base.
2. From a given point on baseline.

